ECG monitoring after acute ischemic stroke: Does patient selection matter?

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EDITORIAL

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Does patient selection matter?

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To prevent stroke recurrence, we treat patients based on the presumed underlying etiology; however, in clinical practice, the underlying mechanism remains undetermined in up to 30% of patients.[1] Atrial fibrillation (AF), a known and frequent culprit for cardioembolic stroke, can be transient and not present at the time of evaluation following a stroke. Treatment differs for patients who have strokes caused by AF because of the high risk of recurrent stroke with AF and the high degree of effectiveness of oral anticoagulants to reduce cardioembolic stroke risk. Several guidelines recommend a minimum of 24 to 48 hours of Holter monitoring in all patients with stroke to identify AF as the underlying source of stroke.[2] Previous studies found that Holter ECG monitoring (24–72 hours) detects paroxysmal AF in approximately 5% of patients with stroke, and longer duration ECG monitoring detects AF in an additional 5% to 30% of patients depending on the type and duration of monitoring.[2–4]

Despite this increasing evidence in support of the effectiveness of prolonged ECG monitoring for the improved detection of AF, the implementation rate in routine clinical practice remains low. For example, among 17,398 consecutive patients with stroke from the Ontario Stroke Registry (2003–2013), only 30.6% of patients received at least 24 hours of Holter monitoring 30 days after stroke and less than 1% of patients received monitoring beyond 48 hours.[2] Results from surveys collected worldwide show very similar results: less than 20% of patients with stroke receive more than 48 hours of Holter ECG.[5] Reasons for the lack of implementation of cardiac rhythm monitoring include logistical challenges, patient adherence, and costs, among others.

Many questions remain. Which patient will likely benefit from long-term ECG monitoring? Should all cryptogenic stroke patients with presumed embolic source of stroke undergo long-term ECG monitoring? Would an alternative approach in which monitoring is allocated to patients at high risk of AF be more cost-effective? Moreover, what should we do about patients with other presumed causes of stroke? For example, should a patient with a clear large vessel stroke (e.g., ipsilateral high-grade carotid stenosis), or a lacunar stroke, also be monitored for longer than 24 hours, since small or large vessel atherosclerosis does not protect them from AF and subsequent strokes due to AF?

In this issue of *Neurology*®, Uphaus et al.[6] derived and validated a simple prediction score for AF in ischemic stroke patients without a history of AF. They used data from 3 different studies (total n = 1,556), consisting of stroke (78%) or TIA (22%) patients with at least 72 hours of ECG Holter monitoring. They identified 77 cases of AF (5%). They defined AF as >30 seconds of arrhythmia within 72 hours of the stroke. They entered and retained candidate variables using logistic regression with backward selection. The authors derived a score they named AS5F (Age: 0.76 points/year, Stroke Severity NIHSS ≤5 = 9 points, NIHSS >5 = 21 points; to Find AF). The authors report a high-risk group of patients (a score above 67.5), which corresponded to a 5.2% risk and a number needed to screen below 20 to observe one case of AF within 72 hours.

The proposed AS5F score has several strengths, including its simplicity and reported ability to discriminate individuals at high risk of developing AF also in patients without a presumed

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cardioembolic source (e.g., small vessel strokes). We commend the authors for bringing a systematic statistical approach to addressing a problem of clinical relevance.

Several limitations warrant mentioning. First, this was a small sample. The derivation set included only 44 cases of AF and the validation set only 33 cases. The small sample size can bias the weights used in the score and lead to inaccurate probability estimates. Second, many other validated predictors of AF exist, which were not retained in the current model (probably because of the small sample size and limited power). These predictors include race, routinely ascertained clinical risk factors,[7] as well as other measures such as P wave terminal force in V1 on the initial routine 12-lead ECG[8] or natriuretic peptides[9] measured on admission with the first blood draw. These measures may substantially increase the predictive accuracy of the score and should therefore be assessed in future studies. Third, with the increasing availability of technology to monitor cardiac rhythms, questions are likely to be centered on appropriate allocation of monitors for long-term AF detection, rather than short-term detection within 72 hours.[4,10]

In the context of the recently published negative results of the Navigate ESUS (Embolic Stroke of Undetermined Source) trial,[11] there is much we still do not understand about the interplay between the presumed mechanism of stroke and AF risk. Future studies are warranted to determine whether an approach of identifying high AF-risk patient groups for underlying AF or even atrial cardiopathy,[12] to guide the utilization of cardiac rhythm monitoring or anticoagulation, is effective.

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